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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/687,309	10/16/2003	Naoto Kimura	NEC 338456	7812
27667	7590	07/14/2004	EXAMINER FARAHANI, DANA	
HAYES, SOLOWAY P.C. 130 W. CUSHING STREET TUCSON, AZ 85701			ART UNIT 2814	
			PAPER NUMBER	

DATE MAILED: 07/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/687,309

Applicant(s)

KIMURA, NAOTO

Examiner

Dana Farahani

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2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 16 October 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Specification*

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 4, and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Alcoe et al., hereinafter Alcoe (US Patent 5,786,635).

Regarding claims 1 and 4, Alcoe discloses in figure 5, a semiconductor device comprising a substrate 12 in which an internal wire is formed; at least one semiconductor chip 18 mounted on the substrate; a heat spreader, 22 and 23, which is used for externally radiating heat from the semiconductor chip; and a heat conductive material 68' having flexibility, which is provided between the surface opposite to surfaces of the semiconductor chip near the substrate and the undersurface of the heat spreader in accordance with the height of the space therebetween, and has a plurality of bumps 26" at least on the semiconductor chip side surface.

Regarding claim 7, there is a flat spring 58' of the heat spreader shown in the figure.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 8 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alcoe.

Alcoe substantially discloses the claimed invention, as discussed above, but does not disclose a plurality of chips. It would have been obvious to one of ordinary skill in the art at the time of the invention to use two, or more chips in the device, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8.

6. Claims 2 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alcoe as applied to claim 1 above, and further in view of Asada et al., hereinafter Asada (US Patent 5,665,651).

Alcoe substantially discloses the claimed invention, as discussed above, but does not expressly disclose a resin is used for sealing the substrate, the chip and the heat conductive structures.

Asada discloses in figure 5, a resin material 8 seals a chip package assembly. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use a resin material to seal the structure of Alcoe in order to further secure,

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and protect the components on the substrate from the external environment of the device.

7. Claims 3, 5, 6, and 10-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alcoe as applied to claim 1 above, and further in view of the Japanese patent 402007550A.

Regarding claims 3, 6, 10, 11, and 13, Alcoe substantially discloses the claimed invention, as discussed above, except for expressly disclosing the heat conductive material has a curvature.

The Japanese patent discloses in figure 1 heat transfer elements 10 are curved on top of the supporting member 10. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to make the heat conductive material of the Alcoe structure curved shaped in order to enhance the heat transfer between the chip of that device and the heat dissipater therein by the means of heat conduction.

Regarding claims 5 and 12, the intermediate plate 68' of the Alcoe reference is copper (see column 10, line 49).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dana Farahani whose telephone number is (571)272-1706. The examiner can normally be reached on M-F 9:00AM - 6:00PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael M Fahmy can be reached on (571)272-1705. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

D. Farahani



LONG PHAM  
PRIMARY EXAMINER